

Retaining Experts: Administrators' Views on Retention Incentives and Older Employees

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ABSTRACT

A survey of members of the American Society for Clinical Laboratory Science (ASCLS) in 2012 examined laboratory administrators' views on retention incentives and older Clinical Laboratory Professionals (CLP). Results indicated that retention strategies currently in place are not concordant with the ones CLP think are important. Further, with the exception of ergonomic equipment, administrators reported low feasibility for the workplace changes favored by practitioners. While all administrators attributed positive traits to older CLP, older administrators held more favorable views. Administrators perceived older CLP as productive, having a high level of technical skills and loyal. The combination of technical competence and work ethic make retention of older CLP attractive to laboratory administrators and advantageous for combatting workforce shortages. This study highlights the discordance between the retention incentives valued by CLP and those viewed as feasible by administrators. Findings should be used by administrators to refine incentive packages that better reflect the desires of CLP.

ABBREVIATIONS: CLP - Clinical Laboratory Professionals, ASCLS - American Society for Clinical Laboratory Science, MLT - Medical Laboratory Technician, MLS - Medical Laboratory Scientist

INDEX TERMS: Workforce, Retirement, Medical Laboratory Personnel

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INTRODUCTION

In the first two articles in this series, the retirement plans of Clinical Laboratory Professionals (CLP), the factors that influence retirement plans, and the incentives that could encourage CLP to work past retirement eligibility were described. Incentives that were considered important in retaining CLP included full health insurance for part-time employees, longevity pay, increased employer contributions for retirement, the ability to work part-time, and a personalized nontraditional schedule. Physical workplace improvements included ergonomic workstations and comfortable break areas. Identifying these incentives and workplace changes could be beneficial because retaining CLP in the workforce could help lessen the predicted shortage of laboratory personnel as the Baby Boomers (born between 1946 and 1964) retire. While identification of what is valued by practitioners is crucial, the feasibility of any workplace changes or additional retention incentives also must be assessed. This study compares the perspectives of practitioners and administrators on the value and feasibility of retention incentives and workplace changes. In order to develop retention strategies that can have a significant impact on workforce shortages, laboratory administrators should use this data to focus their efforts on what matters most to practitioners.

A study of administrators' perspectives on retaining older CLP would be incomplete without also assessing their attitudes about the value of older employees. It is possible that ageism may limit the implementation of

changes directed toward older workers and hasten the exit of older CLP from the workplace. Attitudes held by administrators may be associated with a range of employment practices that affect older workers. These relate to perceptions of older workers with regard to physical capabilities, return on investment, ability to learn new skills and the ability to interact well with younger workers.¹ Studies in a variety of disciplines focusing on the perceptions of older employees have uncovered positive and negative stereotypes about older workers. Some research indicates that older workers are thought to be less productive, less motivated, less physically able, more resistant to change, and suffer from outdated skills and poor health.²⁻⁸ However, older workers are also believed to be more loyal, more reliable, more accurate, possess greater interpersonal skills, have a stronger work ethic, greater organizational commitment, greater knowledge and lower absenteeism.^{2,3,5,8-12} These stereotypes were organized into broad categories by van Dalen and colleagues and labeled as “soft” and “hard” qualities. The soft qualities include social skills, commitment, customer-oriented skills, and reliability³ and have been referred to by others as organizational citizenship behavior.⁶ The hard qualities include mental and physical capacity, motivation to learn new skills, and adaptation to new technology.³ Using these categories and stereotypes, one may predict that administrators perceive older workers as having better soft skills and younger workers as excelling in hard skills.

Productivity of workers is hard to measure and has been examined based on stereotypical views.^{3,4} If the wages of older workers are perceived to exceed their productivity, then older workers represent a potential loss for the company.¹³ For example, not keeping up with technological advances would cause an employee to become less useful and outdated. The stereotypes about hard and soft qualities influence perceptions of a worker’s productivity with the hard qualities having a greater influence.³ Research in other disciplines indicates that employers perceive large differences in the productivity of younger and older workers and that older administrators hold a more positive perception about older worker’s productivity.³

To date, studies of laboratory administrators’ perceptions of older CLP have not been reported. If retaining older CLP is viewed as a potential method to

lessen workforce shortages, stereotypes must be revealed and feasible retention strategies examined. Based on the current research in other disciplines about the perceptions of older workers and stereotypes, it might be concluded that the comparative advantage of the older worker lies chiefly in their soft qualities, but this is not known for the clinical laboratory’s workforce. The present study was carried out to assess laboratory administrators’ perceptions of older CLP and the feasibility of adapting the work environment to retain them. Research questions included:

1. What workplace changes do administrators think are feasible to encourage the retention of older staff members?
2. Is there concordance between retention incentives identified by practitioners and feasible workplace adaptations?
3. What traits do administrators believe characterize older staff members?
4. Do administrators’ views of older workers vary by the administrator’s age or by work site?

MATERIALS AND METHODS

Data for this study were collected as part of the online Clinical Laboratory Professionals Retirement Survey, sent to members of the American Society for Clinical Laboratory Science (ASCLS) via email in May 2012. The survey resulted in 1049 respondents who were still working in the clinical laboratory and represented every state in the union. A description of the survey instrument is contained in the first article of this series, *Retaining Experts: Retirement Plans of Laboratory Practitioners*. All participants were asked questions which addressed options for staying in the laboratory workforce and job satisfaction. Participants who indicated that they supervised or managed others were asked additional questions that assessed feasibility of workplace changes or retention incentives and their attitudes about employees over 50 years old. Subgroups of respondents were analyzed to assess differences based on job function and age group. Job function groups were defined as practitioners and administrators. The practitioner group included respondents who identified their major job function as a phlebotomist, laboratory assistant, Medical Laboratory Technician (MLT), or Medical Laboratory Scientist (MLS). The administrator group included respondents who indicated their major job function was supervisor, manager, administrator, or director. Further subgroups of the administrators were

analyzed to assess any differences based on age: administrators less than 50 years old and administrators aged 50 or older. Respondents who did not indicate their age were excluded from analyses that were based on age group. The study was approved by the Institutional Review Board of the Office of Human Research Ethics at the University of North Carolina at Chapel Hill.

Retention Incentives

In the first section of this study, administrators rated the feasibility of 39 potential retention incentives using a 5-point scale (1=not at all likely, 2=slight possibility, 3=somewhat likely, 4=very likely, 5=extremely likely) or indicated that the incentive was already in place. Retention incentives were grouped in major categories: alternative work schedules, benefits/compensation, education and training, physical environment and technology, redesigned roles, and recognition. Practitioners rated the importance of the same list of retention incentives using a 5-point scale (1=not at all important, 2=slightly important, 3=somewhat important, 4=very important, 5=extremely important). The mean score was calculated for each incentive by group and the means were compared for agreement between the administrators and the practitioners. Mean scores greater than or equal to 3.5 were considered highly feasible (by administrators) or highly important (by practitioners). Additionally, the percentage of administrators who indicated an incentive already existed was tabulated.

Administrators' Perceptions

In the second section of this study, administrators rated their perceptions of 25 characteristics for employees over 50 years old using a 4-point scale (1=strongly agree, 2=agree, 3=disagree, 4=strongly disagree). Administrators were grouped by their age: those less than 50 and those aged 50 or older. Mean perception scores were calculated for each characteristic for all administrators, by administrator age group and by job site. Mean scores less than or equal to 2.5 were considered in agreement with the statement and mean scores greater than 2.5 were considered in disagreement with the statement. The mean perception scores were compared between administrator age group and job site using analysis of variance (ANOVA).

Data Analysis

IBM SPSS Statistics 20 was used to analyze the data collected in this study. Descriptive statistics were used to tabulate responses and calculate percentages and means. One way ANOVA was used to analyze differences in attitudes toward older employees among administrator subgroups defined on the basis of age.

RESULTS

Retention Incentives

The frequency of retention incentives and the mean feasibility and importance ratings are found in Table 1. Respondents who identified themselves as administrators indicated that many workplace retention incentives were already in place. The top five most frequently cited existing incentives for retaining staff were:

- formal recognition for length of service.
- free on-site CE programs.
- financial and retirement planning programs.
- tuition reimbursement for college courses.
- wellness, nutrition or fitness counseling.

Table 1. Retention incentives: Existence in the workplace, administrators' feasibility ratings, and practitioners' importance ratings.

Retention Incentives	Already Exists, % respondents	Mean Feasibility Ratings by Administrators (5-point scale)	Mean Importance Ratings of Practitioners' retention incentives (5 point scale)
ALTERNATIVE WORK SCHEDULES			
Scheduling on day shift only	43.0	2.8	3.4
Part-time work schedules	32.8	3.2	3.7
Limited number of consecutive work days	27.3	3.2	3.4
Scheduling on weekday shifts only	33.9	3.1	3.2
"Personalized" nontraditional schedule	20.5	2.9	3.6
Job-sharing (1 full-time position shared by 2 or more staff)	20.5	2.9	2.5
Scheduling on weekend shifts only	18.5	2.8	1.6
More or longer breaks during Shift	4.1	2.0	2.1

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BENEFITS/COMPENSATION

Financial and retirement planning programs	60.7	3.2	3.3
Wellness, nutrition, or fitness counseling	54.6	2.8	2.6
Group purchase of, insurance e.g., life, disability, long-term care insurance	52.5	2.7	3.6
Full health insurance and other benefits for part-time employees	35.4	2.2	4.2
Longevity pay increases/bonuses	15.8	2.0	4.0
Support to reduce burden of care-giving for dependents	10.6	2.1	3.0
Increased employer contributions for retirement	7.8	1.9	3.9
Increased paid time off for workers over age 50	3.0	1.8	3.5

EDUCATION AND TRAINING

Free on-site CE programs	62.4	3.0	3.4
Tuition reimbursement for college courses	59.0	2.5	2.6
On-the-job re-training for new roles and duties	42.0	3.1	3.4
Paid off-site and online CE programs	46.1	2.7	3.4
Management training	36.2	2.9	2.7

PHYSICAL ENVIRONMENT & TECHNOLOGY

Ergonomic equipment, chairs, and work stations	49.4	3.5	3.7
Improved lighting	37.9	3.3	3.3
Comfortable rest and break areas	46.7	2.6	3.5
Access to magnifying devices at the bench	18.6	3.3	2.8
Reduced standing	25.6	3.1	3.4
Readily accessible equipment to reduce reaching and bending	20.3	3.1	3.3
Increased font size on printed materials and computer screens	20.8	3.0	3.1
Low level of ambient noise to facilitate verbal communication	13.6	2.6	3.3

REDESIGNED ROLES

Assign older employee to a formal mentoring role of new staff/recent grads	15.2	2.9	2.9
Assign older employee to a staff development or student teaching role	18.2	2.6	2.8
Assign older employee to work on special projects	12.7	2.7	3.1

rather than traditional testing role			
Assign older employee to increased direct interaction with users of lab data such as physicians	13.1	2.5	2.6
Assign older employee to less stressful work areas or benches	8.6	2.4	3.0
Assign older employee to "special testing" areas rather than "core lab"	12.8	2.2	2.9
Assign older employee to areas with less testing and more supervisory functions	9.7	2.4	2.5

RECOGNITION

Formally recognize length of service	67.8	3.3	3.1
Frequently seek advice of older employee	25.2	3.0	3.1
Sponsor social functions just for senior staff	4.3	2.0	1.9

Number of respondents	198 - 231	198 - 231	391 - 424
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None of these existing incentives were rated as highly important retention strategies (mean \geq 3.5) by practitioners. Among the administrators whose institutions did not currently offer these incentives, none were rated as highly feasible.

Agreement between administrators' ratings of feasibility and practitioners' ratings of importance was found only for ergonomic equipment, chairs and work stations. This incentive was viewed as highly important by practitioners and highly feasible by administrators. Administrators' ratings of feasibility and practitioners' ratings of importance were in disagreement on eight incentives. Practitioners gave high importance ratings to five factors in the group of benefits and compensation:

- group purchase of insurance, e.g., life, disability, long-term care insurance.
- full health insurance and other benefits for part-time employees.
- longevity pay increases/bonuses.
- increased employer contributions for retirement.
- increased paid time off for workers over age 50.

These five factors were rated as low feasibility by administrators. Similar discrepancies were observed for

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two factors in the alternative work schedules group: part-time work schedules and personalized nontraditional schedule and one incentive in the physical environment group: comfortable rest and break areas. These factors were rated as highly important by practitioners but were not considered highly feasible by administrators. All remaining retention incentives (31) were rated as both unimportant by practitioners and unfeasible by administrators.

Administrators' Perceptions

The mean rating scores for administrators' perceptions of older CLP can be found in Table 2. All administrators agreed with statements at a level of ≤ 2.5 that CLP over age 50:

- want to lead and supervise others
- are reliable
- are burned out
- have a low turnover rate
- are good mentors
- are loyal to the institution
- are creative
- are good teachers/trainers
- are enthusiastic about work
- are productive
- have a strong work ethic
- have high levels of technical/scientific skills
- are resistant to change
- take initiative.

All administrators disagreed with statements at a level of >2.5 that CLP over age 50:

- have high rates of absenteeism
- are difficult to train
- are reluctant to accept work assignments
- want to take a lot of time off to deal with family issues
- do not work well with supervisors of other generations
- have negative attitudes about work
- have very little interest in helping younger employees
- are reluctant to teach others
- often look outside the institution for new career opportunities
- have not kept up with changes in lab technology
- do not work well with co-workers of other generations.

Table 2. Administrators' perceptions of older CLP and comparisons by age group.

Characteristics of Employees Over 50	Mean Administrators N=173-188	Mean Administrators age <50 N=51-57	Mean Administrators age ≥ 50 N=122-131	ANOVA F p
Want to lead and supervise others	2.3	2.6	2.2	11.582 0.001
Have high rates of absenteeism	3.4	3.2	3.5	5.913 0.016
Are difficult to train	3.0	2.8	3.2	14.160 0.000
Are reliable	1.5	1.7	1.5	3.580 0.060
Are burned out	2.5	2.3	2.6	7.751 0.006
Have a low turnover rate	1.8	2.0	1.7	4.150 0.043
Are reluctant to accept work assignments	2.9	2.8	3.0	3.928 0.049
Are good mentors	1.9	2.0	1.8	5.605 0.019
Are loyal to the institution	1.8	2.0	1.7	7.362 0.007
Want to take a lot of time off to deal with family issues	2.8	2.7	2.8	2.580 0.110
Are creative	2.2	2.4	2.0	17.566 0.000
Are good teachers/trainers	1.9	2.0	1.8	2.691 0.103
Are enthusiastic about work	2.2	2.5	2.1	15.263 0.000
Are productive	1.8	1.9	1.8	3.868 0.051
Do not work well with supervisors of other generations	3.0	2.9	3.0	2.211 0.139
Have a strong work ethic	1.5	1.7	1.4	9.128 0.003
Have negative attitudes about work	2.9	2.7	3.0	4.110 0.044
Have very little interest in helping younger employees	3.2	3.0	3.2	8.361 0.004
Have high levels of technical/scientific skills	1.6	1.8	1.6	5.289 0.023
Are reluctant to teach others	3.0	2.8	3.1	5.823 0.017
Are resistant to change	2.4	2.3	2.5	3.193 0.076
Often look outside the institution for new career opportunities	2.8	2.8	2.9	0.046 0.831

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Have not kept up with changes in lab technology	2.8	2.6	2.9	8.375 0.004
Take initiative	2.1	2.3	2.0	5.962 0.016
Do not work well with co-workers of other generations	3.0	2.8	3.1	11.787 0.001

The administrator's age group made a significant difference in agreement or disagreement for only 1 characteristic: want to lead and supervise others ($p=0.001$). Younger administrators disagreed while older administrators agreed that CLP over age 50 want to lead and supervise others. Both younger and older administrator groups disagreed that older workers are difficult to train and do not work well with workers of other generations; however, the older administrators more strongly disagreed and thus, held a more favorable perception of older CLP. Additionally, both administrator age groups agreed that older workers are creative and are enthusiastic about work, but the older administrators agreed more strongly. When compared by job site, no differences in characteristics were statistically significant.

DISCUSSION

The first part of this study examined the feasibility of retention incentives or workplace changes to encourage retention of older CLP and determined if the retention incentives favored by practitioners were also rated as feasible by administrators. If there was concordance between practitioners' preferences and feasibility, then the results would inform administrators on which of the feasible retention incentives they should initially focus to keep older CLP in the workforce past retirement age. However, with one exception, administrators' mean feasibility ratings were low. Laboratory administrators believed that some retention incentives were outside their realm of responsibility to implement and would require action at a higher administrative level. However, it will be important for laboratory administrators to advocate for the workplace changes most important to CLP and this may necessitate meeting with higher level administrators and possibly seeking the support of administrators in other areas such as nursing and radiology.

Five of the retention incentives rated as most important by practitioners were rated as low feasibility by

administrators. For example, benefits and compensation, along with the opportunity for part-time employment were important for retaining CLP past the time of retirement eligibility, but rated low in feasibility. Financial changes to benefits and compensation would require intervention at the institutional level, out of laboratory administrators' authority; however, a facility focused on retaining older CLP would need to advocate for these additional incentives in order to retain staff. The issue of retaining an experienced workforce is not unique to the clinical laboratory. It should be noted that various strategies such as options for reduced working hours, healthier work environments and incentive programs, have been identified in efforts to retain nursing personnel.¹⁴ It may be more effective for laboratory administrators to work together with administrators from other hospital departments to force institutional level changes.

Even though the administrator respondents in this study did not think the incentives valued by practitioners were feasible, the fact that some already existed at some institutions may lend hope for some capacity of change. However, at present, the retention strategies with the highest rates of implementation were not the ones that practitioners thought were important (for example, financial and retirement planning, free on-site CE programs, and formally recognized length of service). Elimination of some incentives that were less valuable to practitioners and replacing them with those identified as important may be less expensive for the institution. Administrators rated only one non-existent retention incentive as highly feasible: ergonomic equipment, chairs and workstations. This is an incentive that could have a large impact on the quality of the work environment for older CLP with a relatively small investment from administration.

The second part of this study examined administrators' views of older CLP and identified differences in views based on the age group of administrators. All administrators attributed predominantly positive traits to older CLP. The perceptions of CLP over 50 were consistently more favorable among older administrators than younger administrators but differences were statistically significant for only one characteristic, want to lead and supervise others.

The present study found that laboratory administrators

perceived older CLP as having both the hard and soft qualities described in other research.³ For example, older employees were viewed as reliable, good mentors, loyal to the institution, and having a strong work ethic which correlate with soft skills. With respect to hard skills, administrators viewed older CLP as productive, and having a high level of technical skills. This is in contrast to research findings in the general literature that suggested administrators may maintain stereotypes about older workers in which they possess an advantage only in soft skills.³ Overall, laboratory administrators attributed predominantly positive traits to the older CLP. The characteristics encompassed technical competence (such as high level of technical skills, and productivity) and personal traits (such as reliability and loyalty). This, on top of predicted and current workforce shortages, makes a compelling argument for the retention of senior staff and therefore the implementation of strategies geared toward retaining senior staff beyond retirement age.

CONCLUSIONS

A report for the Society of Human Resource Management states that experiential knowledge of older workers is “at the very heart of the organization’s future and its sustainability in an ever increasing competitive marketplace.”¹⁵ It is clear that laboratory administrators recognized many positive characteristics of older CLP, but they will inevitably be confronted with the challenges of increased retirements of seasoned professionals without making efforts to retain these valuable employees. On top of this, there are too few younger CLP to replace the retiring CLP. How administrators will handle these workforce challenges remains unclear. Replacing seasoned CLP who leave or retire has high organizational costs and designing policies that enhance the employability and productivity of older workers will be crucial. Strategic efforts must be used to keep older CLP in the workplace longer and recruit retired CLP back to work. Laboratory administrators must focus on ergonomic changes in the physical environment as well as improvements in employee benefits to support what is valued and desired by the aging, experienced CLP. Results of this study provide a starting point for initiating a productive dialogue between laboratory administrators, human resource officers and others concerned about staff shortages due to an aging workforce. It is possible that personnel from other clinical departments may value

the same incentives identified in this study of laboratory professionals. Future research should survey a broader sample of the allied health workforce to detect any similarities and collect evidence that could be presented to institution executives. Employers, administrators and human resource departments have a vital role in directing the necessary changes in organizations to retain the aging workforce and lessen workforce shortages in the laboratory.

REFERENCES

1. Taylor P, Walker A. Employers and older workers: attitudes and employment practices. *Ageing Soc.* 1998;18:641-58.
2. Hassell BL, Perrew PL. An examination of beliefs about older workers. Do stereotypes still exist? *J Organ Behav.* 1995;16:457-68.
3. van Dalen HP, Henkens K, Schippers J. Productivity of Older workers: Perceptions of Employers and Employees. *Popul Dev Rev.* 2010;36:309-30.
4. Chiu WCK, Chan AW, Snape E, Redman T. Age stereotypes and discriminatory attitudes towards older workers: An East-West comparison. *Human Relations.* 2001;54:629-61. Available from: <http://hum.sagepub.com/content/54/5/629.full.pdf+html>. Accessed 2013 Aug 29.
5. Tillsley, C. The Impact of Age Upon Employment. *Warwick Papers in Industrial Relations.* 1990;33.
6. Ng TWN and Feldman DC. The relationship of age to ten dimensions of job performance. *J Appl Psychol.* 2008;93:392-423.
7. Rosen B, Jerdee TH. The nature of job-related age stereotypes. *J Appl Psychol.* 1976;61:180-3.
8. Warr P, Pennington J. Views about age discrimination and older workers. In *Age and employment: Policies and practices.* London: IPM, 1993.
9. Kovner CT, Brewer CS. Work attitudes of Older RNs. *Policy Politics Nursing Practice.* 2007;8:107-119. Available from: <http://ppn.sagepub.com/content/8/2/107.full.pdf>. Accessed 2013 Aug 29.
10. Gringhart E, Helmes E, Speelman C. Exploring Attitudes Toward Older Workers among Australian Employees: An Empirical Study. *J Appl Psychol.* 2008;38:751-78.
11. Steinberg M, Walley L, Tyman R, Donald K. Too Old to Work? In Patrickson M and Hartmann L (eds), *Managing an Ageing Workforce*, Woodslane Pty Ltd, Warriewood, NSW, 53-68.
12. Guest R, Shacklock K. The Impending Shift to an Older Mix of Workers: Perspectives from the Management and Economics Literature. *International Journal of Organisational Behaviour.* 2005;10:713-28.
13. van Dalen HP, Henkens K, Schippers J. How do employers cope with an ageing workforce? Views from employers and employees. *Demogr Res.* 2010;22(32):1015-36.
14. Cyr, JP. Retaining Older Hospital Nurses and Delaying Their Retirement. *JONA: J Nurs Adm.* 2005; 35(12):563-7.
15. Lockwood NR. *Attracting and retaining the mature workforce.* Alexander, VA: Society for Human Resource Management. 2005. Available from: <http://www.shrm.org/Research/Articles/>

Articles/Pages/ManagingtheMaturingWorkforce.aspx. Accessed
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